What is Claimed:

1. A device for converting at least four parallel data streams on respective input data lines into one serial data stream on a fiber optic data line, the device comprising:

a first multiplexer for multiplexing at least two of the parallel data streams into a first intermediate output stream;

a second multiplexer for multiplexing at least two other of the parallel data streams into a second intermediate output stream;

a serializing transmitter coupled to the first and second multiplexers for serializing the first and second intermediate output streams into the serial data stream, and

a signal for synchronizing the serializing of the first and second intermediate output streams and tagging output data in the serial data stream as corresponding with data from each of the respective input data lines.

2. The device of claim 1 including an optical transmitter for transmitting the serial data stream onto the fiber optic data line.

3. The device of claim 1 wherein the data from each of the respective input data lines is 9 bits wide and an output frame in the serial data stream is 24 bits long.

4. The device of claim 3 wherein the signal includes a cycle having a first phase and a second phase, the first phase for tagging the output frame

to the data from two of the respective input data lines and the second phase for tagging the output frame to the data from another two of the respective input data lines.

5. The device of claim 3 wherein a parity generator is coupled between the first multiplexer and the serializing transmitter for adding a parity bit to one of the respective input data lines.

6. A device for converting a serial input data stream on a fiber optic data line to at least four parallel data streams on respective output data lines, the device comprising:

a receiver for de-serializing the input data stream into first and second intermediate parallel data streams,

a first demultiplexer for demultiplexing the first intermediate parallel data stream into two parallel data streams on two respective output data lines;

a second demultiplexer for demultiplexing the second intermediate parallel data stream into two other parallel data streams on two other output data lines; and

a signal for synchronizing the de-serializing of the first and second intermediate output streams and tagging data in the serial input data stream as corresponding to data in each of the respective output data lines.

7. The device of claim 6 wherein the receiver includes an optical receiver for receiving the serial input data stream from the fiber optic data line.

8. The device of claim 6 wherein the data from each of the respective output data lines is 9 bits wide and an input frame in the serial input data stream is 24 bits long.

9. The device of claim 8 wherein the signal includes a cycle having a first phase and a second phase, the first phase for tagging the data from two of the respective output data lines to the input frame and the second phase for tagging the data from two of the other respective output data lines to the input frame.

10. In channel-to-channel communications among devices, wherein each device has a plurality of ports for connecting to communication links between the devices, a method for communicating between two devices over a single link comprising the steps of:

(a) converting a plurality of data streams from respective ports of a first of the two devices into one serial data stream, including the steps of:

(i) multiplexing at least two of the plurality of data streams into a first intermediate output stream;

(ii) multiplexing at least two other of the plurality of data streams into a second intermediate output stream;

(iii) serializing the first and second intermediate output streams into the serial data stream,

(iv) synchronizing the serialization of the first and second intermediate output streams.

(v) tagging output data in the serial data stream as corresponding to data from each of the respective ports of the first device, and

(vi) transmitting the serial data stream on the single link to a second of the two devices;

(b) converting the serial data stream in the second device to at least four input data streams, and

(c) sending each of the input data streams to a port of the second device.

11. The method of claim 10 wherein step (b) includes the steps of:

(i) de-serializing the serial data stream into first and second intermediate parallel data streams,

(ii) demultiplexing the first intermediate parallel data stream into two parallel data streams on two respective data lines;

(iii) demultiplexing the second intermediate parallel data stream into two other parallel data streams on two other respective data lines;

(iv) synchronizing the de-serialization of the first and second intermediate output streams and

(v) separating data in the serial data stream to data for each of the respective data lines.

12. The method of claim 10 wherein the single link is a fiber optic link.

13. The method of claim 10 wherein the tagging step includes providing a signal having a cycle with a first phase and a second phase, and tagging two of the respective ports with the first phase and tagging two other respective ports with the second phase.

14. The method of claim 10, wherein each of the plurality of data streams include data having a predetermined protocol, the method including the steps of

initializing communications between the first and second devices using the predetermined protocol,

transferring the plurality of data streams between the first and second devices, and

checking status between the first and second devices free of disrupting the transfer of the plurality of data streams.

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